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NEWS ISSUE — JULY 29, 1948

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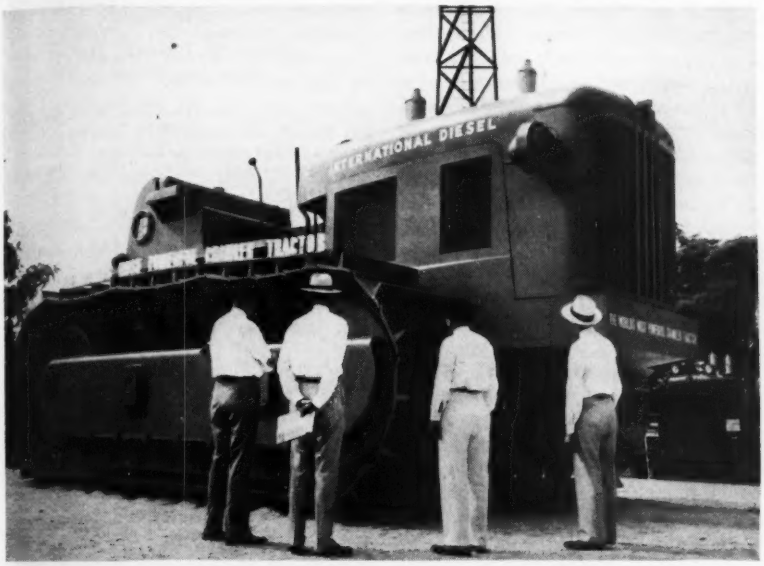
News of the Week

ENGINEERING NEWS-RECORD • JULY 29, 1948 • VOLUME 141 • NUMBER 5



SHAPE OF THINGS TO COME—Bigness in equipment is old stuff to construction men. So, when this huge wooden replica of a tractor, several times actual size, was used as the focal point of the International Harvester Co. exhibit of the Road Show, the first thought of many visitors was that it was the real thing.

Record Road Show stresses size, rubber, power, control

After eight pent-up years the traditionally indoor Road Show burst forth this month at Chicago and spread over 30 packed acres, mostly unroofed. Many of the 335 exhibits were in the galleries underneath Soldier Field stadium, but by far the greater proportion were on the parking fields to the south and east of the stadium.

Nominally an exhibit of road building equipment, the show actually was a national construction machinery fair. Portable hod-hoists and pumped-concrete rigs vied with pavers and asphalt plants for attention of the spectators. Everyone was in the act; many a manufacturer presented his complete line.

Approaching the show from the single Soldier Field parking lot left unfilled by exhibits, the visitor saw a skyline dominated by several crane-booms. Once inside the grounds, he began an inspection—easily an all-day walk—which would try his understanding and defy his power to integrate what he saw.

One key to the show might be found on the ground below each of the tallest booms. Those booms were on truck or lorry-mounted machines on rubber tires.

While most applications of rubber tires are not new, wider acceptance of those applications is significant. The truck cranes are but one example. The trend also is apparent in equipment for earthmoving, compaction, aggregate-processing, and to a lesser degree, paving. With this trend there has come competition in some lines which formerly were the domain of the innovators.

Earth-moving equipment

Two-wheel tractors hauling two-wheel carrying scrapers once were produced only by R. G. LeTourneau. At the show, other makers, Heil, LaPlant-Choate, Caterpillar and Wooldridge, displayed machines of this type. Wooldridge also displayed a 20-cu. yd. semi-trailer wagon hauled by a 2-wheel tractor. The heavy-duty, rubber-tired, 4-wheel tractor also gave evidence of coming importance. A 225-hp. 4-wheel tractor hitched to a 22-yd. bottom dump semi-trailer, is Caterpillar's second wheel tractor. Another powerful wheel tractor is the M-R-S designed to haul the Mississippi Wagon and other units. A larger unit is the 4-wheel Euclid 240-hp. tractor with 30-yd. trailer wagon.

While most of the 4-wheel tractors are primarily for medium speed haulage, two are bulldozer units. LeTourneau exhibited "The largest bulldozer in the world", a butane-propane-driven 750 hp. model weighing 93,000 lb. with a blade 16½ ft. wide. Turning is by all-wheel clutch and braking. LaPlant-Choate had on display a motor dozer with an 11-ft. blade, 225-hp. diesel engine and 42,000 lb. weight. All wheels steer hydraulically.

A definitely new piece of self-powered equipment which excited considerable pro and con comment at the show was the Wagnermobile Scraper-dozer. Schematically a giant 6-wheel motor patrol with 15-yd. carrying scraper in the blade position, this machine mounts a bulldozer blade at the 4-wheel end. Hydraulically steered wheels at the other end also are driven by torque rod and gear boxes. The operator sits sidewise, driving the rig up to 30 mph. in either direction.

Turning back to heavy earth-hauling units, the 22-ton Euclid dump truck now has competition in the 22½-ton Mack. A 275-hp. diesel engine on each drives a single dual-wheeled rear axle. In addition, Euclid is producing a 15-ton dump truck. The Winch-Lift dump trailer embodies a new principle. In dumping, a winch on the tractor pulls the semi-trailer wheels forward, as two struts from the tractor to the front end of the dump body push the body into dumping position. For spot dumps, the tractor pulls back to the trailer.

For loading haulage units, standard excavating machines were displayed, with the emphasis on rubber wheels in the lighter models. One departure from the predominant loading method of earlier years is the giant Euclid loader, a heavily-powered deep-cutting version of the older elevating grader.

(*Continued on page* 13)

NEWS IN BRIEF

In telegraphic form, here are latest news developments on the engineering and construction front during the week.

Housing—Construction of a $1,515,000 public housing project in *Syracuse, N. Y.*, will get under way this month with the Progressive Builders, Inc., of Camden, N. J., as general contractors. . . . At *Houston, Texas*, 16 two-story brick and asbestos siding apartment houses will be built at a total cost of $1,320,000. . . . Schaaf Bros. Construction Co. plans erection of $1,000,000 worth of homes in *Erie, Pa.* . . . Construction of Virginia Manor has begun in *Dallas, Tex.* The 156-unit rental apartment project will take one year to complete and will cost $1,237,000. . . . Ground has been broken for a $3,000,000 apartment at *Seattle*, Wash., by Nettleton-Baldwin-Anderson, Inc.

Highways—*Wyoming* has recently contracted for road and bridge construction totaling nearly $1,750,000. . . . *Virginia* reports spending of more than five cents out of every highway dollar for removal of buildings along rights-of-way. . . . The *Ohio* Contract Carriers Association, Inc., has submitted a ten-year $148,000,000 highway construction program to improve 4,000 miles of road in the state. . . *Boston, Mass.*, will benefit by contract for over $5,000,000 covering 4,000 ft. six-lane highway extending from Sumner Tunnel to the McLellan Highway. . . . Blue Ridge Parkway in *North Carolina* and *Virginia* will cost the federal government $3,000,000 during the fiscal year.

Labor—Carpenters of *Warren, Ohio*, have accepted a 12½ cent hourly wage increase, retroactive to July 1, and have agreed to submit an additional 12½ cents demand to arbitration. . . . Tentative agreements have been reached in the building trades work stoppage at *Mobile, Ala.* . . . In *Dallas County, Tex.*, an increase of $1 per day has been granted to glaziers, painters, and light and heavy equipment engineers. An increase of $2 per day was granted plumbers, bricklayers, sheet metal workers and carpenters.

Industrial Construction—Mississippi Power & Light Co. has announced purchase of land near *Meridian* as site for its new 40,000 hp. steam plant to be constructed at a cost of $4,000,000. Pacific Gas & Electric Co. has started work on the seventh new power plant in its $400,000,000 expansion program. . . . Crosby Construction Co., *Chicago*, will erect a $3,000,000 addition to the Spencer Kellogg & Sons soybean processing plant.

Public Building—Voters of *Mobile, Ala.*, have approved bond issues totalling $1,190,000 for school buildings and a mental institution. . . . Work on a new wing for the University of Virginia Hospital will commence with the new year. . . . *Philadelphia's* board of education has announced approval of bond issues for three elementary schools to cost in excess of $7,500,000. . . . Upwards of $12,000,000 in hospital and health center construction has been approved by a committee of the *Virginia* Advisory Hospital Council. . . . Illinois State Normal University, *Normal, Ill.*, plans a $9,000,000 construction expansion program.

Miscellany—Plans for a $7,000,000 shopping center to serve 37 towns in *New Jersey* have been discussed at a meeting of residents and business men. . . . Work has been started on two water tunnels at the site of the proposed Blakely Dam, in *Oklahoma*, by the Stolte Co. of Oakland, Calif. The tunnel contract involves over $4,000,000 worth of work. . . . *Pennsylvania* has contracted with the Academy of Natural Sciences of Philadelphia for aid in its pure stream program. . . . *Sunbury, Pa.*, announced plans for a sewage disposal plant to cost $1,150,000. . . . Officials of *Connecticut's* 22 paper mills are considering recommendations to be forwarded to State Water Commission engineers for the prevention of stream spoilage.

THE COVER PICTURE

When engineers for the Tennessee Valley Authority set off 840,000 lb. of explosives to obtain a million cubic feet of loose rock for South Holston Dam, near Bristol, Tenn., officials said it was the biggest blast in construction history. The blast leveled half a mountainside.

More than 5,000 persons witnessed the blast, which was felt and recorded by a seismograph 465 miles away.

TVA established the previous record several months ago when it touched off 526,000 lb. of explosives at Watauga Dam, near Elizabethton.

The South Holston Dam was authorized in 1941 and construction started in 1942. Halted by the war, work was resumed in August last year. The dam will be 1650 ft. long at the crest with a maximum height of 290 ft.

ENGINEERING NEWS-RECORD

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CAA asks and gets bid bonds for engineering work in Alaska

Engineering firms called on for 10 percent guarantee with bid, for performance bond, and payment of liquidated damage

The Civil Aeronautics Authority last week had awarded a $232,000 contract for engineering services on a contract that required bidders to submit a guarantee with the bid in the amount of 10 percent of the bid, post a performance bond in amount of 50 percent of the value of the contract, and accept liquidated damages of $200 per day.

The contract was for engineering on a commercial airport at Anchorage, Alaska and was awarded to Thomas B. Bourne Associates, Inc., of Washington, D. C. Similar bids for a large airport at Fairbanks will be opened Aug. 2.

The original invitations to bidders, containing the bond requirements, were protested by at least one engineering firm, which characterized as "not proper procedure" the requirement that a firm of professional engineers submit a proposal involving furnishing a certified check or bidders bond.

CAA officials, queried at Washington by *Engineering News-Record*, said the Anchorage contract was a special case, since the airport had to be started shortly under terms of a $3,500,000 cash authorization and $9,000,000 in contract authority granted by Congress. Officials said that the government agency would normally accept bids for engineering services without bid bond, surety bond or liquidated damages, but said that in the case of Anchorage they regarded the bidding requirements as protection for bidders and government.

Engineer protests

The bid-invitation used was the government's Standard Form No. 20, which asked for sealed bids by 2 p. m. July 15, for "engineering design and inspection services incidental to the construction of an International Express Airport near Anchorage Alaska." On the back of the form was a statement that the guarantee, performance bond and liquidated damages would be conditions of the bids.

The only plans attached were topographic maps of an area of about two miles square, showing very rough terrain; and a general layout drawing.

On July 1, in response to an invitation to bid on the engineering work, Arthur W. Consoer, of the Chicago consulting firm of Consoer, Townsend and Associates, telegraphed Ralph A. Rich and Judd M. Fowler, chiefs of the CAA procurement division at Anchorage, that his firm could not respond to the invitation unless the requirements for bonds and liquidated damages were waived.

"We think it is not proper procedure for a firm of professional engineers to submit a proposal involving a certified check or bidders bond with a proposal for engineering services," Mr. Consoer said. "Neither do we consider it compatible with good professional practice for an engineering firm to furnish a surety bond or to accept a contract involving the possibility of incurring responsibility for liquidated damages.

"We have practiced professional engineering for almost 30 years . . . never before have we been called upon to submit a bidders bond, a surety bond, or to agree to pay liquidated damages. . . ."

Mr. Consoer said he received a telegraphic reply from Mr. Rich, which said in part: "Sorry government regulations require bond. Unable to waive this requirement."

CAA explains

At Washington, the CAA pointed out the need for speed on the Anchorage work, and added that present international tension make Alaskan airports nouncements of probable rises in prices critically important—the CAA had promised Congress it would get civilian airports built in a hurry to relieve the pressure on military airfields.

CAA's federal airways division and its regional administor—Walter P. Plett of Region 8 at Anchorage—decided to use Standard Form No. 20, officials said, because the proposal is simple, straightforward and quick. More important, it is fully legal and conforms with all decisions of the Comptroller General.

Officials emphasized that its use at Anchorage is not a precedent, and that more normal procedures will be followed in normal cases.

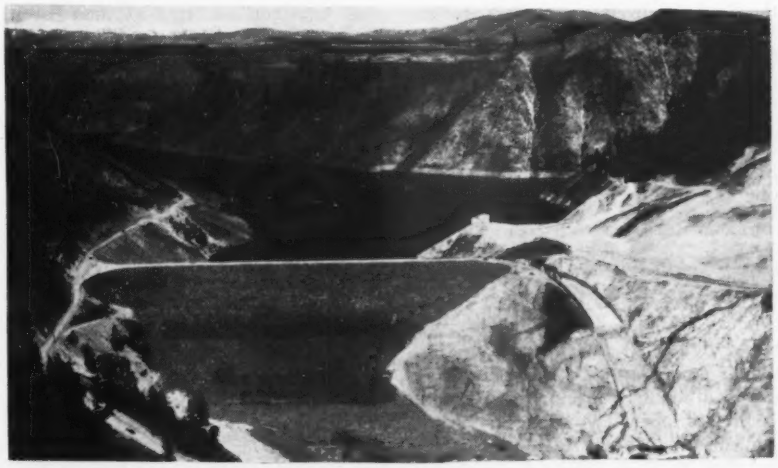
For the Anchorage work, however, CAA said it considered the bonding requirements a protection for bidders and the government in that they acted as a brake on bidders "who did not know the country and were in danger of losing their shirts". At the same time, the government was protected from a low bidder who might be ill-equipped to tackle the severe conditions.

Although official bidding lists had not arrived in Washington last week, it was known that about eight firms submitted bids on the proposal. The Flora Engineering Co. of Cheyenne, Wyo. was second low bidder, its figure being within a few hundred dollars of the Bourne bid.

Steel price mounts to absorb wage rise

Following closely on earlier an- of steel, the United States Steel Co. last week said that new prices will include an average increase of about $8.09 a ton.

The steel companies have recently abandoned their basing point pricing system and last week announced wage raises amounting to 9 percent to their workers (*ENR*, July 22, p. 37).



ANDERSON RANCH HELPS OUT—Supplemental water for the 320,000-acre Boise Project is stored behind Anderson Ranch Dam on the South Fork of the Boise River in southwestern Idaho while construction continues on spillway, outlet works and power house. The reservoir will be completely filled for the first time in 1949.

FOREIGN DEVELOPMENTS

POST-WAR POWER PROJECT—Hydro development under way in the Bavarian Alps is first such construction since the war. River diversion in progress will increase the Walchensee storage by 50 percent and boost power output to 210 million kwh. annually. Work includes 4.3 miles of tunnel and a 2,135 ft. siphon.

Germany—Diversion of the Rissbach, a mountain tributary of the Isar River, into Walchensee (Walchen Lake), key storage reservoir for present and projected hydro developments along the Isar, represents Germany's first major post-war job in this field of construction. Begun last October on a 2½ year schedule, it involves two tunnels totaling 4.3 miles in length joined by a 2,135 ft. siphon under the Isar River. It is a project of Bayerwerk AG, Bavarian public stock company.

After the last war the upper reaches of the Isar were diverted into Walchensee by a canal, and the storage used to supply a 650-ft.-head power plant, the Walcheseewerk, which discharged into Kochelsee, another lake. From here the water flowed down the Loisach-River and thence through a short canal back into the Isar (see map). The purpose of the Rissbach diversion is to increase the storage of Walchensee from 60,000 to 90,000 acre-ft. and as a consequence—the power output of the hydro plant from 120 to 210 million kwh. annually, or about 74 percent.

Additional projected work includes a reservoir in the old bed of the Isar below the existing diversion works for supplemental storage that can be used for hydro-power production during the winter period.

First priority has been given to the Rissbach project because its completion will add 90 million kwh. to Germany's power output without requiring any additional generating equipment, manufacture of which would be difficult—if not impossible—for German industry. The Rissbach will be dammed at a point about 1,000 ft. from the Austrian border. From the reservoir so formed, the gravity-flow tunnel will carry the water northward into Walchensee. Neither the Grasberg, as the part of the tunnel south of the Isar is called, nor the Hochkopf, the name of the northern half, present any unusual design or construction features. In contrast, the siphon under the Isar is quite out of the ordinary. Because of the shortage of steel, conventional methods of laying it within steel sheetpile cofferdams could not be used, and a concrete caisson construction method has been adopted instead.

Two caissons, 130 ft. long and 18x13 ft. in section, will be sunk through artificial "islands" constructed out from either bank of the river. The siphon itself, which is built into the caissons, is a pipe of ⅛-in. steel sheet 8½ ft. in diameter. An unusual feature of the construction plant is the use of a gantry frame straddling the caisson from which the airlock is suspended by a block and tackle. A man-and-material shaft of steel pipe connects it to the working chamber of the caisson.

Public Works

India — Approximately $3,000,000 will be spent for construction of a four-mile sewer at Calcutta, India. The drain, requiring a total of 6,000,000 cu. ft. of excavation, is due for completion by 1958. Rate of flow provided is to be about 48 mgd. The structure is to be of cement and brickwork on a reinforced concrete raft foundation carried by 25 ft. wood piles.

Nearly 6,000 additional tube wells for irrigation will be constructed in India in the next five or six years, in an effort to increase food grains production by 10,000,000 tons annually to remove the constant threat of scarcity. Irrigation is a vital factor in food production. American experts on tube wells are being invited to survey the provinces and prepare construction schemes.

Mexico—Pilot cuts have been completed for two cutoffs on the Rio Papaloapan, in the State of Vera Cruz. Flood flow is relied upon to enlarge the pilot cuts to full-sized river channels. Both cuts were recently opened in anticipation of the high water season which reaches its peak in August. Contracts for five additional cutoffs are to be let sometime in September.

Canada — Building materials in Canada exceeded the demand for the first three months of 1948, according to a review published in Ottawa by Central Mortgage and Housing Corporation. Construction contracts awarded for the first five months of the year totaled $349,000,000—about 38 percent more than last year. The increase is to some extent due to a change toward housing construction from industrial work, residential building in Canada being at an all-time high.

Transport

Turkey—The Turkish government is going ahead with its previously announced expansion of civil aviation facilities.

Two large international airports are to be built at Istanbul and at Ankara in an effort to encourage international air traffic to and through Turkey. U. S. Civil Aeronautics Administration engineers in 1946 consulted with the Turkish State Airlines on technical matters, and soon thereafter the airlines signed contracts with Westinghouse Electric International Corp. and with J. G. White Engineering Corp. for construction and equipping of the two new airports.

Both terminals will be equipped for all-weather operation. Completion of the airports in 1949 will allow the use of new and heavier type transport planes in this area.

Netherlands—The Dutch Government has rejected a plan of the Royal Dutch Airlines to construct a central airport at Burgerveen (southwest of Amsterdam), to take the place of Schiphol.

The government decided to retain Schiphol and to construct a new airfield

at Schieveen, near Rotterdam, where preparatory work has already started. It is hoped that the airfield will be completed in four years, at an estimated cost of $9,000,000.

Italy—Rapid population growth in Italian cities has presented the important problem of urban transportation needs. Many main existing streets have a maximum width of 25 meters, hindering speedy transportation. Prior to the war a subway crossing the center of Rome had been started, but outbreak of the war and material shortages prevented its completion. The Italian Ministry for Transport has just authorized completion of this line by 1950. The Milan city Council has approved a project for the construction of an underground railroad system connecting the northern and southern ends of the city, and Naples and Genoa are among other Italian cities considering the construction of such facilities.

India—The president of the Indian Roads and Transport Development Association has reported that "no great progress was made" in the development of Indian highways in the year 1947. He reported that there was little prospect of funds being made available to implement the famous Nagpur plan of 1943 which called for construction of 150,000 miles of village roads.

A $30,000,000 rail link across hitherto inaccessible hill country has been undertaken by East Indian Railway in order to open previously unexploited coal deposits. Roughly 150 miles in length, it has been estimated that about 34 percent of the whole route will be curves averaging 45 degrees to the mile. Eight major bridges and 200 minor bridges are called for in the first 40-mile section now under construction.

China—Improvements of Whampoa harbor are planned by the Kwangtung Provincial Government. New wharves and warehouses will be constructed and dredging of the harbor is already under way.

Chinese leaders, with the prospects of United States aid, have revived an old dream of a railroad link between the riches of China's west and the coastal cities of the south. Various plans for the rail link—all still in the dream stage—are under consideration.

Germany—A summary evaluation report on the German motor road system prepared by British experts, is now available to the American public, the Office of Technical Services, Department of Commerce, announced recently. The report is based on investigations in Germany by a group of British engineers in 1946.

CHINESE LINK—Destroyed by the Japanese during the late war, this 1,700-ft. bridge has recently been rebuilt and put in service by U. S.-trained Chinese engineers employed by the Chekiang-Kiangse Railway—an important link between the port of Shanghai and the Chinese interior. Original steel trusses were raised from the river mud, and much of the stringers and rails were also salvaged for re-use during the year-long rebuilding operation. Yu-Fan Yeh, who spent nearly a year studying U. S. engineering methods during the war, was in charge of the work for the railway.

Israel—The newly formed state of Israel is prepared to construct a system of modern highways, according to David Sandler, of Tel Aviv. Road building is to receive top priority as soon as peace is established. Parts of the proposed modern system are to connect every community within the state.

Industrial Developments

Argentina—Two new cement plants are being erected in the Argentina to help overcome a chronic shortage that has forced cement rationing and curtailed part of the five-year plan.

A $2,000,000 plant capable of producing 500 tons daily will be erected in the province of San Juan, and will have its production aimed at rebuilding the city of San Juan, which was destroyed in an earthquake in 1944 and not yet rebuilt. The other new cement plant is the old Wolverine Portland plant from Cold Springs, Mich., which has been transplanted to the Argentine oil fields and is now in production.

South Africa—The manufacture of copper tubing in South Africa will end the building bottleneck caused by the shortage of galvanized piping. Two factories, one in Cape Town and the other in Vereeniging, in the Transvaal, are turning out the tubes from copper produced in the mining areas of northern Rhodesia.

France—An aerial tramway nearly five miles long—part of a vital project in the industrial reconstruction of western Europe—is now being speeded toward completion.

The tramway is a preliminary step toward the construction of Chastang Dam, located on the Dordogne River at Argentat.

Australia — The former munitions compound at Salisbury, which once employed 7,000 workers, is to be converted to a rocket research station.

Atomic Energy

England—Britain's second large-scale atomic energy pile will be in operation this summer, the Ministry of Supply announced recently.

The big pile, at Harwell in Berkshire, will produce enough radioactive isotopes to supply the needs of all the medical and other scientfic research workers investigating peaceful uses of atomic energy in Great Britain. It will also provide the first domestic application of atomic energy by providing heat for all the buildings at the Harwell research station.

This pile will be a big-brother to the "Gleep" (graphite low energy experimental pile) which was set going last year.

Products of the Harwell piles are to be packaged and distributed by the government-controlled Radiochemical Center at Amersham, in Buckinghamshire. Considerable progress has been made at Harwell in designing safe packages for shipment of radioactive materials so that if an accident occurred in transit no radioactive substance would escape.

Improved financing of power work urged at Seattle ASCE convention

Speaker suggests revenue bond financing for federal power projects —Disclose plan for floating vehicular tunnel

Federal power projects should be financed by the issuance of revenue bonds rather than by federal appropriations, and the federal government should adopt a business viewpoint in the management and planning of such projects, members of the American Society of Civil Engineers were told last week.

Meeting at Seattle, Wash. in an annual convention, ASCE members concentrated their attention on Pacific Northwest power plans and problems, and heard discussions of other engineering features including a proposed floating tunnel across Puget Sound and developments on the second San Francisco Bay crossing.

The financing and rapid construction of power projects to increase the manufacturing potential of the northwest was the key to talks by E. L. Grant, professor of economics of engineering at Stanford University, and Paul J. Raver, administrator, Bonneville Power Administration.

A government corporation might be established, Prof. Grant said, to issue revenue bonds for construction of power projects, the bonds to be "repayable exclusively out of the revenues from the sale of power from a single project or from an integrated group of projects such as those on the Columbia River.

"The economic soundness of each ... would (thus) be subject to the critical test of the investment market, and federal water power projects would be clearly differentiated from other federal water projects that are supported partly or entirely from tax funds," the educator added.

"What is needed is a frank recognition by the federal government that it is in the power business in this area. It should assume the obligation to maintain capacity in advance of demand. During a period of business prosperity, projects that are exclusively or primarily for power should be built first;—multiple-purpose projects can be deferred."

Business approach urged

A "management" approach to programming, timing and financing an expanded development of hydro power in the northwest was urged by Mr. Raver.

"No nation, and no region within a nation, can make progress and support an ever-rising plane of living standards except in terms of an assured energy base," he said. "This must be an expandable, cheap energy base. Productivity is increasingly dependent on the machine, and the machine is increasingly dependent on energy from electric power."

Mr. Raver emphasized that hydroelectric power must be developed in an orderly manner, as needed, and not "confined to public works programs that are normally geared to national employment programs.

"Power is not a gift from Uncle Sam —it is a bankable asset," he concluded.

Papers presented before the power division at the meeting also emphasized the need for expansion of production capacity. Barry Dibble, consulting engineer of Redlands, Calif., pointed out that the present capacity in the five northwestern states is 3,589,364 kw., whereas the area could absorb 8,200,000 kw. by 1953. R. Wayne Lincoln, senior engineer for the Corps of Engineers at Seattle, said that ultimate economical development of hydroelectric prime power in the Columbia River Basin may approximate 17,000,000 kw.

Floating Tunnel Proposed

Speaking before the largest group to attend one of the ten technical sessions, C. E. Andrew, chief consulting engineer for the Washington Toll Bridge Authority, described a proposed floating tunnel to cross Puget Sound.

Emphasizing that much study was yet needed, Mr. Andrew said that such a tunnel was apparently the only solution for a vehicular crossing of the 800 to 1,000 ft.-deep channel.

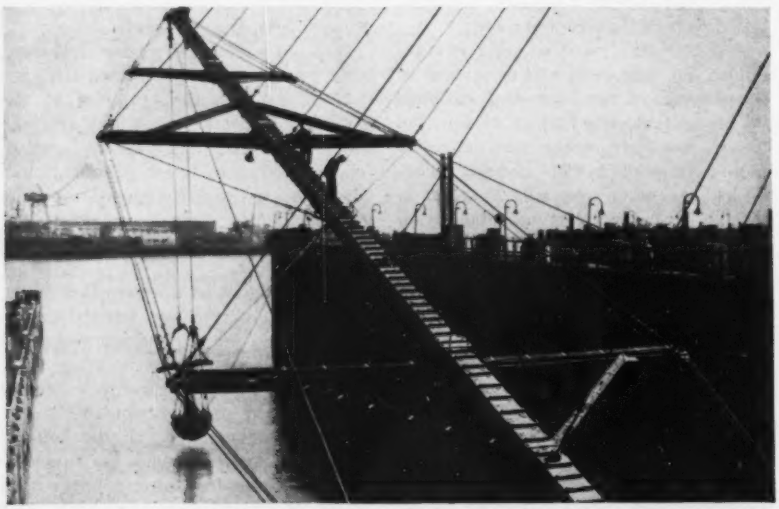
The plan involves twin reinforced concrete tubes of two-lane capacity each, floating beneath the surface of the sound to provide a 50 ft. clearance for surface vessels. It would extend three miles, to connect Seattle with Bainbridge Island, east of Bremerton, and be held in place by anchors and air chambers.

Three intermediate ventilating islands are proposed, to be protected by substantial fender systems. Total estimated cost is $55,000,000.

A second complicated crossing problem was discussed by Ralph Tudor, chief engineer for the San Francisco Bay Toll Crossings Division of the California Department of Public Works, who discussed planning for a second bay crossing facility.

He said his division would make a definite recommendation for either a combination fill-tunnel-trestle crossing proposed by a joint Army-Navy board or a bridge, or both, late this fall. Construction of either or both crossings may be started in 1950, and must start by 1953, when the present structure becomes debt-free.

A. H. Ayers, engineer for the Utah Construction Co., detailed the method now in use to dewater a 2,000 x 600 ft. area of the Colorado River bed at Davis Dam (*ENR* Aug. 22, 1946, vol. p. 23). This involves 290 well points spaced about four feet apart on a 1,175-ft.



BIG BOOM—Final inspection of rigging on dredge Neptune's new boom is completed before the 242 ft. arm goes to work on levees for the Sacramento River in California. The boom, weighing 40 tons, was put together as four pieces.

header just below the upstream cofferdam, and 260 on a header above the downstream cofferdam. A parallel line will be installed at the upstream cofferdam as excavation deepens. About 22,000 gpm. of pumping is expected.

Other speakers included: R. B. Rothschild Jr., of the San Francisco contracting firm of Haas and Rothschild; G. T. Treadwell, chief engineer for the Port of Seattle; Ben C. Gerwick, president of Ben C. Gerwick, Inc.; William C. Hill, of the Oregon State Board of Aeronautics; and R. E. Dougherty, ASCE president.

Mr. Treadwell commented that since the cost of pressure-treated timber and piling today approaches—and in some cases exceeds—costs of reinforced concrete and steel, these latter materials will in part supplement wood in future Seattle port construction work. Mr. Gerwick, speaking "as a contractor with experience on several jobs of this type in the San Francisco area", said precast concrete methods make possible faster construction and greater labor productivity. He cautioned, however, that proper design, attention to details of connections, proper handling and transportation equipment, skilled crews and experienced supervision were necessary.

Resolutions

A convention business session adopted the wording of two proposed constitutional amendments regarding dues. These will be included in a letter ballot.

If approved, the amendments will (1) Raise dues for corporate members $5 and juniors $2.50; and (2) eliminate the dues differential between District 1 members and those in other districts.

The board of direction authorized formation of a joint cooperative committee for better coordination of activities between ASCE and the Associated General Contractors.

Low bids received for Soo power plant

The Tuller Construction Co., Red Bank, N. J. and the Dunbar & Sullivan Dredging Co. of Detroit, Mich. were low bidders July 15 for final construction contracts on the 14,500-kva hydroelectric power plant project at St. Mary's Falls Canal, Sault Ste. Marie, Mich., according to Col. A. Riani, Detroit District Engineer, Corps of Engineers.

The work is divided into two lots. Lot No. 1 includes the excavation of the upper headrace and the tailrace and construction of rock-fill dikes. Lot No. 2 includes the construction of the power plant, installation of equipment, and miscellaneous work on the dikes.

The Tuller Construction Co. bid $3,564,700 for Lot No. 2, and the Dunbar & Sullivan Dredging Co. bid $916,175 for Lot No. 1. The government estimate, based on performing the work by U. S. plant and hired labor, including all supervision and overhead costs, totaled $4,843,270. Total of the two low bids is $4,480,875.

AN ACRE OF OIL—This welded steel rectangular fuel oil storage tank holds the entire load of an ocean-going tanker. It covers a full city block in New York City. Its four compartments total a capacity of 13 mg.

HIGHWAY NEEDS CITED

Conservative estimates of the American Association of State Highway Officials reveal the need for $22 billion worth of construction and reconstruction on our federal-aid highway system, according to W. W. Polk, Chief Engineer, Ill. State Highway Dept., and chairman of the ARBA International Committee, speaking at the road show.

This task is difficult in view of the critical shortage of professional and subprofessional engineers, currently estimated to be 10,000, according to Mr. Polk. The shortage will probably become more acute since civil engineering courses in our colleges are not attracting sufficient young men. Moreover, civil engineering graduates are not greatly interested in entering highway work due chiefly to the relatively small salaries paid both young engineers and those with many years of experience in that field.

Mr. Polk called for the cooperation of all members of the road-building team since the nation's economy is so closely connected with adequate road facilities. Congress has provided funds for continuing the work through the 1948 Federal Aid Highway Act and many of the states have made provision for supplying the necessary matching funds.

Contractor gets damages through state road error

The Connecticut State Highway Department was found to have made "grossly inaccurate and misleading representations" to contractors bidding on construction of the Hartford bypass approach to the Charter Oak Bridge.

The State Superior Court therefore awarded damages of $61,314 to the Deliso Construction Co., Inc., of Springfield, Mass., plus interest at 6 percent a year from September 25, 1941 to bring the total to more than $85,000.

According to information presented to the court, the highway department in 1940 made soundings for the construction of 7,400 ft. of the bypass in Wethersfield. The department estimated the total excavation would be 125,983 cu. yd.

The Deliso Company submitted a low bid on the work on the assumption, company officials said, that there would be no rock to be excavated, and its low bid was accepted.

On being told by the highway department that there would be about 40,000 cu. yd. of rock to be excavated, the company immediately asked to be excused from its bid but the highway commission declined. The company decided to go ahead with the work rather than forfeit its bid bond.

Subsequently, the total rock excavation amounted to 69,000 cu. yd. The superior court's decision said that the company had relied on "false and misleading information" and the company had the right to rescind its contract. "The state cannot contract to relieve itself from liability for its own fraud," the court said.

MUNICIPAL AFFAIRS

PROPOSED SUSPENDED SPAN—Crossing the Narrows at the entrance to New York's harbor, the six-lane suspension bridge pictured in the above photo-diagram would be the world's longest. Planned to connect Staten Island, shown on the left, with Brooklyn and Long Island on the right, the $75,000,000 project has been submitted for War Department approval.

Seeking to ease traffic congestion in lower Manhattan, and to provide a direct link from Long Island through Staten Island to New Jersey, the Triborough Bridge and Tunnel Authority last week revived a plan for a bridge connection across the Narrows between the upper and lower bays of New York harbor.

The new bridge, which would have a center span of 4,620 ft. and thus become the longest suspension structure in the world, would cost $75,000,000, authority engineers said.

Robert Moses, chairman of the authority, said that it had submitted an application to the War Department for the new structure, and that if the proposal is approved, the bridge would not be available for about ten years.

Discussed for nearly 40 years, the problem of providing a connection between Long Island and Staten Island across the Narrows has long plagued traffic experts. Naval authorities have previously opposed such a bridge on the ground of possible hazard to the huge Brooklyn Navy Yard, upstream from the bridge location. However, the bridge authority officials pointed to recent approval of a bridge over the Delaware River seaward of the Philadelphia Navy Yard. These officials added that steadily rising costs had precluded consideration of a tunnel connection such as was proposed in 1945 at an estimated cost of $73,500,000.

The proposed bridge would carry six traffic lanes, 227 ft. above mean high water at the center. The center span would be 420 ft. longer than the center span of the Golden Gate Bridge in San Francisco.

Other traffic plans

Attacking their traffic problems from many angles, city officials during the week came up with numerous solutions.

At Milwaukee, Wis., city officials involved in the planning of a new civic center, considered a recommendation for establishing an "inner cordon" of expressway streets that would carry principal through traffic around the civic center, rather than through it as had been originally planned. Engineers pointed out that a trafficway through the civic center would effectively cut it in half and make pedestrian travel difficult.

Two New York cities prepared for new street alignments with state assistance. The state Department of Public Works began a comprehensive survey of traffic conditions in the city of Oneida preparatory to a plan for a state financed system of arterial routes to be undertaken within the city; and the state proposed the development of a 5-mile urban arterial system of highways in the city of Batavia, also as a part of its urban program.

Marion County, Ind., said it would push a $1,000,000 program of replacement of outmoded, hazardous bridges in several sections of the county; and in Toledo, Ohio, planning officials set a fall deadline for completing the mapping of Toledo's expressway and major thoroughfare system.

Airport planning

The San Francisco Manager of Utilities recently announced a $4,000,000 project for expansion and improvement of the city's airport. The work will be the second large expenditure from a $20,000,000 bond issue approved in 1945.

At Billings, Mont., the city airport commission has recommended acceptance of a $73,178 federal grant for airport improvements that would include repaving of the east-west runway, paving an additional apron, a taxi strip and a section of the northwest-southeast runway. A 6-in. water main and an 8-in. sanitary sewer also would be built to the east end of the field.

The St. Louis, Mo., Board of Public Service announced that it would install 150 parking meters in front of the Terminal Building at the Lambert-St. Louis municipal airport.

At the same time, the Municipal Airport Commission has recommended construction of a new $2,000,000 group of hangars at the airport to provide more space for commercial airlines using the field.

City planning

The Baltimore Planning Commission named Arthur McVoy, formerly planning consultant to the Ocala, Fla., planning board, as the director of the Baltimore City Planning Commission.

Kansas City, Mo., announced that it would have public construction projects totaling $9,500,000 under way before winter this year, including first work on two superhighways through the municipal area.

Wilmington, Del., received a preliminary report from consulting engineers on present and probable future trends in New Castle County population, to be used for a master plan for future development.

Sewer problems

The city of Oakland, Calif., led off the news of sewage developments with the announcement that it had balked at a contention by the East Bay Municipal Utilities District that the city must finance lateral lines connecting city sewers to the $23,000,000 disposal system now under construction by the district.

John S. Longwell, chief engineer

and general manager for the district, explained that the utility district act stipulated that the district build only intercepting and outfall lines, and not lateral lines. Therefore, the city would have to build the remaining connections.

Miami, Fla., opened bids for the third time within a year for construction of a $5,600,000 sewer system, and received only one bid. The bid totaled about the $5,600,000 remaining of a $6,400,000 bond issue, but commissioners were told that the company, R. J. Holly, Miami, would have to insist on an ascalator clause covering any increase above 10 percent in present labor wage scales.

And Oklahoma City, Okla., faced the problem of replacing a great many sewer mains in the northwest section of the city, where old lines, badly weakened by sewer gas, have collapsed, forcing raw sewage to the surface.

Harlan Chase, city engineer, pointed out that in wet weather excessive infiltration of groundwater into these weakened pipes occurs, and they collapse under the added strain.

Smoke control

Muncie, Ind., digging into its files for some means of controlling smoke nuisances, discovered an ordinance passed in 1931 which legal officials thought might still be applicable.

Robert L. Wolf, city combustion engineer for Indianapolis, Ind., said he had succeeded in persuading the Citizens Gas & Coke Utility—owned by the city but independently managed—to employ a full-time air purification engineer.

Meanwhile, Mayor Al Feeney of Indianapolis instructed the City Board of Air Pollution Control to begin work on a new anti-smoke ordinance with "teeth" in it.

At Philadelphia, the city named Herbert Packer, now chief of the Division of Sanitation, as head of the newly created Smoke Abatement Division.

Water supply

The City Council of Dallas, Tex., ordered a general survey of the city's water needs to provide data for expanding the water system.

Councilmen were told that despite the "best efforts" of the water department there have been periods each summer since the war when consumers could not obtain enough water. The shortages were the result of lack of pumping capacity, lack of filtration capacity, and lack of capacity in the distribution system, and point up the narrow margin under which the city's water department is now operating.

A similar situation at Ashland, Ohio, where insufficient filtration capacity has caused a critical water shortage, was partly remedied when the city's largest industry lent two pumps to the waterworks, pending a $350,000 waterworks improvement program which is now in the specification stage.

Kokomo, Ind., began work on its $500,000 expansion program with the laying of 6-in. water mains at the west end of the city.

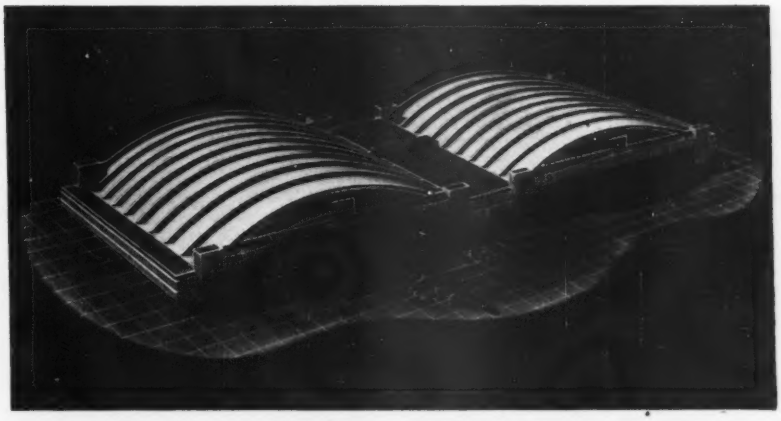
Dayton, Ohio, looked on in dismay as new estimates for its long planned water softening plant placed the cost at $4,127,000. The city had expected to pay $1,800,000 for the plant when the project was first conceived in 1943.

The Metropolitan Water District of Southern California announced that it had increased its rate for softened and filtered Colorado River water delivered to southern California cities from $15 to $18 per acre-ft.—the equivalent of 4.13 cents per 100 cu. ft.

Most serious water problem apparently was faced by cities in Los Angeles County's coastal basin where salt water invasion has become so serious that ultimate destruction of the fresh water supply is threatened, officials were warned.

J. F. Poland, of the U. S. Geological Survey's ground water division, said that the fresh water level is now 70 ft. below sea level despite the Los Angeles County Flood Control District's elaborately developed subterranean storage system that is based on the use of spreading grounds to maintain local levels.

The fresh water supply, already badly depleted through abnormal wartime and postwar industrial expansion, is threatened not only by the saline seepage, but by oil field brine and industrial waste, Mr. Poland reported.



HANGARS FOR IDLEWILD—Proposed hangars for the New York International Airport would have arches spanning 300-ft. Two complete designs—one in fireproofed steel and one in reinforced concrete—have been prepared incorporating identical facilities in order to get competitive bids on steel and concrete. If a steel design is accepted, the protruding arch ribs will not appear. Roberts and Schaefer, Chicago, are engineers for the Port of New York Authority on these hangars.

Outlaw bidding rules

The New Jersey State Supreme Court ruled that Trenton's street paving specifications are "unreasonable," in that the city required bidders on paving work to have an asphalt plant located in the city limits.

The decision was the result of a taxpayers' suit against the city which charged that the specifications were "arbitrary, discriminatory and stifling to competition." Local observers saw the decision as a clear victory for the Kingston Bituminous Products Co., which has been trying for years to win the right to bid on city street paving work. At present, only three contractors are permitted to bid on paving work, since they are the only ones with asphalt plants in the city.

Justice Frederic R. Colie held that the result of the city's contract requirements might be the exclusion of a lower bid.

Philadelphia harbor jobs

Among major projects to be undertaken by the Army Engineers in the Philadelphia area will be dredging of the Schuylkill River to provide a 33-ft. channel from the Delaware River to Passyunk Ave., deepening the present channel by 5 ft. Col. F. F. Frech, Army District Engineer, said that other work under an $8,500,000 appropriation will include the enlargement of the Mantua Creek anchorage in the Delaware River; major repairs to Barnegat Inlet jetties, and other work.

Wide World Photo

FLOOD WATERS IN MIDWEST—Packing plant (center) at Emporia, Kas., was swamped by waters of the Cottonwood and Neosho rivers as rain-swollen streams isolated parts of the midwest last week.

U. S. and Canada move to repair flood damage

Moving rapidly to repair flood damage in the wake of recent Pacific Northwest floods, the United States and Canadian governments anounced definite steps for relief last week.

The Canadian federal government and the provincial government of British Columbia announced the appointment of a joint Fraser River Diking Board to supervise reconstruction of the dikes in the Fraser River valley. The federal government has offered to pay 75 percent of the cost of this work, estimated at about $12,000,000. J. B. Carswell, of Vancouver, civil engineer who was at one time prominent in the construction industry in Toronto and Hamilton and who served as representative of the Canadian Department of Munitions and Supply in Washington during the last war, is chairman of the board. Other members are F. G. Goodspeed, assistant chief engineer of the federal Department of Public Works, and Bruce Dickson, British Columbia Diking Commissioner.

In the United States, the U. S. Soil Conservation Service assigned four engineers to work with farmers in the flood zones to repair damaged farm lands.

At the same time, the forest service announced that 85 to 90 percent of its $2,350,000 fund for repair of flood damaged forest roads will be spent on the Chelan and Wenatchee forests in Washington. In the two areas, 166 road and trail bridges and about 60 miles of road were lost.

Record flood breaks southwest drought

A rainfall of record proportions—more than 25 inches in 24 hours—late in June broke an extreme drought condition along the Rio Grande in Texas, and brought with it a record flood.

Preliminary data indicate that throughout most of the region, the river gage heights and discharges have been exceeded only once within recorded history—during the record flood of 1932.

The storm which produced the flood centered east of Del Rio, Texas, and recordings of rainfall showed that from 25 to 30 inches fell over a wide area—most of it within a period of less than 24 hours. In the vicinity of Del Rio, the rise was sharp—discharges jumping from 1,200 second-feet at 10 a. m. June 24 to 48,000 second-feet at 2 p. m. the same day. By 11 p. m. of that day, the discharge had reached a peak of 485,000 second-feet.

This tremendous rise in the streams disrupted operation of two hydroelectric power plants and a steam plant of the Central Power and Light Co., and destroyed the main crossing of the Southern Pacific Railroad.

At Rio Grande City, about 100 miles downstream of Laredo, the discharge June 24 was 640 second-feet. On June 29, a flood-peak of 150,000 second-feet reached that city.

Because the Rio Grande is an international stream, a complete investigation of the flood, its cause and effects has been started by the International Boundary Commission.

Bureau reports figures on construction activity

Construction activity during the first five months of 1948 averaged $1,200,000,000 (billions) per month. Value of work put in place to May 31 totaled $6,000,000,000 (billions), according to joint estimates of the Bureau of Labor Statistics and the Office of Domestic Commerce reported last week. Twelve months at this rate would produce a year's total of $14,400,000,000 (billions) in bricks laid and nails driven.

For May, new work put in place had an estimated value of $1,400,000,000, a gain of 11 percent over the preceding month and of 40 percent above May 1947. Privately financed housing rose to $575,000,000 and commercial construction to nearly $100,000,000. Industrial building continued a gradual decline to a value of $114,000,000 for the month, nearly 20 percent less than in May last year.

A 28 percent gain in highway and street work contributed to an increase of $51,000,000 in public construction. For all public work, the value of construction put in place during May was $338,000,000, the greatest monthly total since last October's postwar high.

During the five-month period, the total construction expenditure was 35 percent above the first five months of 1947. Important percentage increases occurred in: private residential building, up 62 percent to $2,500,000,000 (billions); private commercial construction, up 51 percent to $443,000,000; privately financed public utilities, up 36 percent to $175,000,000; and federal conservation and development work, up 62 percent to $185,000,000.

Georgia is successful in fighting malaria

Public health engineering has reduced the malaria problem to a bare minimum, according to L. M. Clarkson, Georgia health department official. Deaths from the disease have been reduced from 677 reported in 1929 to 12 last year.

Called Georgia's most dramatic engineering feat by the health department, the problem was solved by drainage and DDT spraying of buildings. Drainage work began in 1923 and reached a peak in 1935, when WPA labor was available. DDT has been put to use only in the past few years.

Mr. Clarkson stated that it is now the "time to direct activities to the individual cases." The opportunity presents itself "to eradicate malaria in Georgia."

PERSPECTIVE . . . .

Back to firm bids?

Until the end of last week, when steel and cement prices began threatening to throw the picture out of focus, a major trend was apparent in construction.

It was a slow but perceptible changeover from the cost-plus-fixed-fee contract so much overworked during the war, to lump sum, firm-price or guaranteed-price bids. The trend was spurred by the increasing ability of contractors to get firm materials prices, and firm bids from their sub-contractors.

The trend toward fixed prices in industrial building was marked in a nationwide survey conducted by *Engineering News-Record* and *Business Week*—a sister publication—which showed that more and more contractors are changing back to pre-war firm bid practice. The trend is not yet general—it cannot even be measured in percentages—but most contractors recognize its appearance.

Factors are: The apparent desire of industrial concerns to have exact figures on what their contemplated expansion will cost; the general firming of material prices; and the contractors' own desire for a definite figure within which to operate.

Construction men well know, of course, that some types of construction can never be done on a fixed bid basis, and that some buyers of construction will always demand a cost-plus contract in the belief that it will leave them free to make changes as the building progresses, and that by proper management the buyer can save some money. However, the smaller buyers—and more particularly, the governmental buyers of construction—are now insisting on knowing exactly what their costs will be.

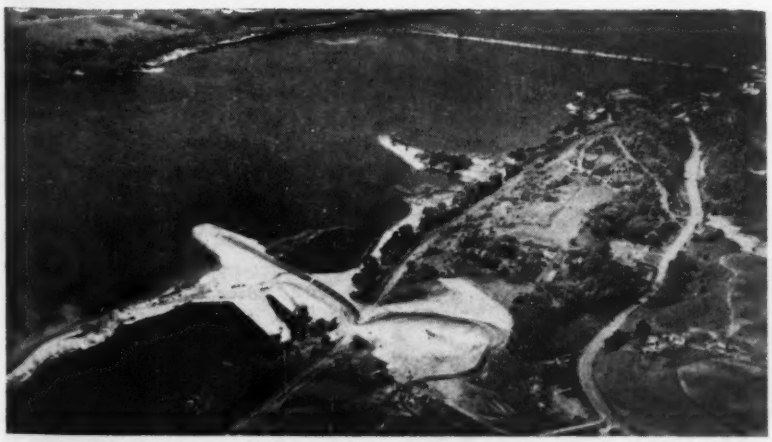
Most contractors, however, are still protecting themselves against unforeseen increases by the inclusion of escalator or percentage clauses that will cover them in the event of a rise in labor costs or in other special fields.

Corroborating the trend was the result of a survey conducted by the Associated General Contractors, which queried 103 of its chapter managers and secretaries on general business conditions.

The AGC reported that while in most areas non-residential construction costs are still showing a tendency to move slightly upward, there are "signs that stabilization might occur at or near present cost levels."

"Material supplies, with the exception of steel and cement, are improving or ample in many areas," the AGC said. "General contractors are demanding and getting firm prices on most materials.

"The availability of construction-workmen appears to be satisfactory except for shortages of bricklayers and plasterers in some areas and skilled operators of some highway and heavy construction equipment."



GROUND WORK STARTED—Eastern approach has been leveled for the new crossing to replace the St. Croix River toll bridge at Hudson, Wis. The $2,500,000 project is sponsored by the Wisconsin and Minnesota state highway departments and will virtually put the town-owned toll bridge (background) out of business.

U. S. pushes court moves against price-fixing

Action by the justice department last week produced price-fixing indictments against 13 paint manufacturers and an antitrust decree against five companies making cast-iron pressure pipe.

In Pittsburgh, a federal grand jury indicted 13 manufacturers of paint and allied products on charges of price fixing—and named certain officials of each company. The justice department asked for the indictments as part of its program aimed at illegal conspiracies in the housing and construction field. It charged that the defendants suppressed competition by agreeing to fix and maintain prices, with the result that buyers paid more for the manufacturers' products.

In Trenton, N. J., a federal judge entered an antitrust decree against five manufacturers of cast-iron pressure pipe, ending past illegal practices and restoring competition in the industry. The justice department had charged that the defendants had created a trade monopoly by means of lease-license agreements under which the U. S. Pipe & Foundry Co. of Burlington, N. J., licensed all patents and leased machines to the other companies for making pipe.

Army begins testing underground structures

First blast in the underground explosive test program of the Corps of Engineers was touched off July 27, according to an announcement last week by Lt. Gen. R. A. Wheeler, chief of engineers. Initial explosions were to be made in dry sand and dry clay at Dugway Proving Ground, 80 miles southwest of Salt Lake City, Utah, using 320-lb. and 2,560-lb. charges of TNT.

Start of the tests had first been scheduled for June 1 (*ENR*, April 15, vol. p. 546). In addition to the Dugway explosions, later tests will be made during the fall and winter in granite, sandstone and limestone, with charges increasing to 40,000 lb. (half scale) and 320,000 lb. (full scale) of TNT. These tests in rock will be conducted at Buckhorn Wash, 30 miles from Price, Utah, and at Unaweep Canyon, 30 miles south of Grand Junction, Colo.

The corps of engineers is carrying out the underground explosion test program for the army to measure the destructive effect of the explosive charges and to develop design criteria for future underground structures and tunnels able to resist enemy bombing.

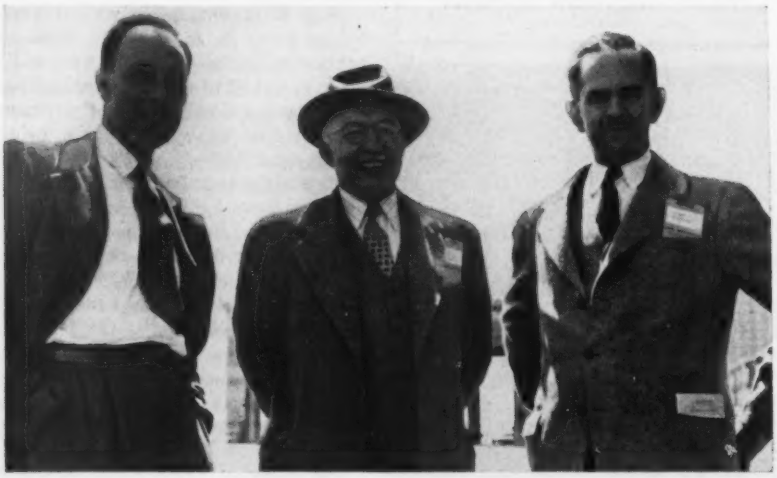
MEN AND JOBS

Col. Gerald E. Galloway, district engineer of the Little Rock, Ark., Engineer District, has been transferred to Washington, D. C. On Aug. 26 he will report to the Industrial College of the Armed Forces. **Col. Thomas A. Lane,** Corps of Engineers, will succeed Colonel Galloway at Little Rock.

Colonel Galloway has been at Little Rock since March, 1946. His first problem as district engineer was the reorganization of the district from a military mission to a large civil works program which had remained inactive and grown in need during the war. During the time that he has served as district engineer, active local flood control projects, with the exception of West of Morrilton, have been under way or have been completed from Fort Smith to Pine Bluff.

Colonel Lane, who is now a member of the faculty of the Air Command and Staff School at the Maxwell Air Force Base, during the early 1930's was an assistant to the district engineer at Memphis, when the area now covered by the Little Rock District was a part of the Memphis engineer district. Colonel Lane was graduated from West Point in 1928, and has been on various assignments with the Corps of Engineers. During the war he served on the staff of General MacArthur, for which service he was awarded the Distinguished Service Medal.

H. G. Smith, construction engineer, Oregon State Highway Commission, points out progress on the Columbia River Highway dredged fill to others of an inspection party standing on the deck of the dredge Clakamas. The others are, in the usual order, Carl A. Peterson, resident engineer; Ray Webber, assistant construction engineer; and E. G. Smith, project manager for the Hydraulic Dredge Co., Oakland, Calif., contractor on the project.



South American experiences were recalled by (left to right) E. A. Williamson, professor of sanitary engineering, North Carolina State College, Raleigh; B. H. Swab, assistant engineer, Jones and Henry, Toledo, Ohio; and H. G. Baity, professor of sanitary engineeering, University of North Carolina, Chapel Hill, at Atlantic City, N. J., during the recent annual American Water Works Association convention.

Col. D. A. Morris, formerly executive officer, Great Lakes Division, Corps of Engineers, Chicago, has become district engineer at Duluth, Minn., replacing Col. Frank L. Beadle retired. Colonel Morris is a civil engineer graduate of Iowa State College, 1921. A veteran of both world wars, in 1941 he took a battalion of the 21st Eng. Regiment to Iceland where he was in charge of all Air Force construction. He commanded the assault forces on Iwo Jima and later base developments from November, 1944, to January, 1946.

Stanford E. Harris, head of the Lenoir, N. C. water department for the last five years has resigned to become superintendent of Goldsboro, N. C., water department.

Waldo Wegner has resigned as city engineer at Mason City, Iowa, to become city manager of Chariton, Iowa. Wegner, a 1935 civil engineering graduate of Iowa State College, was a lieutenant in the Navy Civil Engineer Corps during the war. He served with the Seabees in the Aleutians.

Herman G. Baity of the University of North Carolina's School of Public Health has gone to Brazil to be associated this summer with a Brazilian Agency operated by the Institute of Inter-American Affairs. He will be located in the Amazon Valley with headquarters in the State of Para.

Arthur D. McVoy, an assistant professor of city planning at the Massachusetts Institute of Technology and a lecturer on the same subject at Harvard University, will be the first director of planning for Baltimore, Md. He has had much experience in city planning, having done work for Buffalo, N. Y., Tacoma, Wash., Corvillis, Ore., and Ocala, Fla. In 1942 he was planning technician with the National Resources Planning Board.

Lt. Col. L. E. Funchess has received orders transferring him from the Tulsa District, Corps of Engineers, Tulsa, Oklahoma, to the Engineer School, Ft. Belvoir, Virginia.

F. L. Lawton, formerly assistant chief engineer with Aluminum Co. of Canada, Ltd., is now head of the newly-formed power department of Aluminum Laboratories, Ltd. Mr. Lawton was associated with the wartime expansion of power and other plant facilities of the Aluminum Co., especially at Shipshaw.

Record road show stresses size, power

Continued from first page

The cutting edge, adjustable to 2-ft. depth or to 9½-ft. width, feeds to a 54-in.-wide belt conveyor which loads directly into haulage units, traveling on the right side. Hauled by the largest crawler tractors, this crawler-mounted rig has its own 200-hp. diesel engine for driving the conveyor and the hydraulic blade adjustments. The unit is sized to complement the largest haulage units. All operations are controlled from the driver's seat of the tractor.

A minor trend noted in motor patrol graders was an increase in auxiliary equipment. For instance, the Austin-Western all-wheel drive-and-steer 99, is adaptable to a variety of added equipment. A dozer and the traditional scarifier operate from the same hydraulic ram at the front. A roller at the rear may be rammed down to take the full rear wheel load as the front wheels provide traction. A towed elevating conveyor for picking up windrowed material is powered by take-off from the 99. Rear-wheel steering enables the rig to crowd a snow wing. Other attachments seen on graders at the show included sweeper brooms and front loaders.

Another noteworthy road excavating machine is the Buckeye highway-widener, a modification of the traction ditcher in that the digging assembly is on one side instead of the center. This machine will take up to a 48-in. bite out of existing side cuts.

At least three makers, Barber-Greene, Parsons, and Buckeye, now are in the high-speed narrow-ditcher field. These machines cut half-foot-wide trenches 4 ft. deep, for small drains and pipelines. The Parsons and Barber-Greene models are tire-mounted, and the Buckeye is crawler-mounted.

Compaction equipment

Following upon the heels of soil mechanics advances of the past ten-odd years, manufacturers have developed a variety of equipment for subgrade and other compaction. In keeping with the pneumatic-tire equipment trend already noted, the newest item displayed is rubber-mounted. This is the Cedarapids Compactor, the larger of which is a 30-ton tractor-drawn model riding on two 24:00x32 tires. Vibration is imparted to the earth by an engine-driven eccentric rotor connected with the axle. Excellent compaction of any but impervious soils is claimed.

Other rubber tired compactors shown included the familiar straight-wheel and oscillating-wheel models by several makers. Notable among these is a smaller version of the Porter 200-ton straight-wheel. Another is the Bros 50-ton compactor with oscillating wheels, built for haulage by the LaPlant-Choate two-wheel tractor.

Several towed tamping rollers with various types of feet were shown, as was one small self-powered rig, a Farmall tractor with Ragland tamping rear wheels. Small compaction devices shown included the Jackson soil compactor, the Wayer impactor and the Barco rammer. The first is a vibrating motor mounted on a corrugated skid. Its primary function is consolidation of granular materials in places inaccessible to larger machines. Jackson engineers promise a tractor-towed battery of these machines for compacting large areas. The Wayer machine, looking like a small power mower, bounces a rectangular steel plate on the surface to be compacted. Barco's unit is gasoline-powered, self-contained, and actually hops up and down to consolidate soil.

Aggregate-processing machinery

Extensive portability on tires also was noted in the several crushing, screening, drying and loading assemblies for aggregate processing and asphalt production. The New Holland portable crushing plant featured individual electric drives to crushers, screens and conveyors. The newest of the asphalt plants was the Perribone-Mulliken portable batch asphalt plant. Mounted on four rubber-tired wheels, it consists of a deep skip, tandem heating and drying drums and a high pugmill which bottom-dumps directly into trucks. Each of the basic units has 20-cu. ft. capacity. Rate of processing is 40 tons per hour. The skip is charged by batch bins, trolley batcher, or by dump truck.

While most of the concrete paving items displayed were not new, two features were noted: the Koehring 16E rubber-mounted paver with a boom which may be elevated 60 deg. from the horizontal; the Ransome 34E dual-drum paver with 37-ft. boom. The Koehring traveling speed of 8 mph. enables fast portability for miscellaneous paving operations. The long boom on the Ransome may be used for paving full two-lane width from the shoulder.

The Dotmar Speedmaster is a self-propelled curb and gutter paver that rides on steel forms as it shapes and finishes monolithic curb and gutter from concrete shoveled into its small hoppers.

Somewhat more on the scientific and speculative side of concrete pavement work was the Roebling exhibit, where scale loads were applied to a 1/10 model concrete highway slab prestressed with wire rope. Supported at 10-ft. intervals, the slab experienced repeated large deflections without appreciable cracking.

Material handling

In the field of material handling, exhibitors showed machinery adapted to all kinds of construction. Two significant concrete handling developments, power buggies and air-entraining concrete dump bodies, were displayed at the Road Show.

Makers of dump bodies for carrying air-entrained concrete emphasized the equipment cost-saving features of their products, pointing out that because air entrained concrete does not segregate readily, the material may be hauled without the aid of expensive agitators or mixers. Transit-mixer manufacturers admitted interest in the situation but felt that concrete merchants need the mixers and agitators so that they may supply a demand for all mixes, from the stiffest to the leanest, with and without air entraining agents.

Power buggies

Power buggies noted include the Kwik-Mix Motor-Bug and the Bell Prime Mover, both 10-cu. ft., and the 12-cu. ft. Whiteman. On the Whiteman, the operator rides.

Concrete bucket and platform hoists, one of them the truck-mounted Wagner Towermobile, were on exhibit. At least two makers of non-portable rigs gave

(*Continued on following page*)

BIGGESTS

While not attempting to list the "biggests" of the many heavy equipment lines at the Road Show, *Engineering News-Record* editors nevertheless had little difficulty spotting a few giants. The biggest pneumatic tire stood alone and unmounted at the LeTourneau exhibit; it was a 36:00 x 40 Firestone, on which the Peoria manufacturer had rolled an experimental 60-yd. carrying scraper.

Marion brought a 3½-yd. diesel shovel to the lot. All operations but swing are air-controlled. Swing is diesel-electric.

A neat escape from the moot "most powerful crawler tractor" question was embodied in the huge wooden International mock-up. "Honorary Sidewalk Superintendents" (the Show's paying guests) were inclined to take the monster as a matter of fact—probably a natural reaction to the World War II bulldozer legend.

Record road show stresses size, power

(*Continued from page* 13)

free rides in their hoists. Their rides were especially popular among amateur photographers. Wagner also had its combination 2-yd. mixer and bucket hoist at the show.

For hauling cement the 125-bbl. Gramm low-pressure air-unloading semi-trailer was presented. Low-pressure air is fed into the outlet-channel through a diffuser to aerate the lower layer of cement. The cement becomes fluid and passes out the discharge as more cement falls into position for flow-aeration. Air is supplied from either of two small compressors mounted on the frame, or from the engine exhausts in an emergency.

Many scoop loaders, both truck and tractor attachments and fully self-contained units, were to be seen. One of the smallest units was the Arrow Scooter-loader an 8 cu. ft. 9 hp. model. Hough had a complete line, topped by the 1½-yd. Payloader mounted on a 4-wheel drive rear-steering tractor. Elevating conveyors, mostly with power feed, shouldered high among several exhibits. One of the most spectacular material handling items was a 30-cu. yd. Page dragline bucket recently built for coal strip-mining.

Power controls

Up to this point, little mention has been made of power controls. In general, the use of power controls has been dictated by the size of equipment: Larger equipment, more power control. However, some makers of graders, smooth-wheel rollers, and other steered equipment, have added power steering to medium-weight models which previously were muscle-steered. The hydraulic booster appears most popular for steering. Several of the shovels and cranes feature air control on their clutches. LeTourneau is using electric motor control on many of his machines. No trend, one way or the other, to hydraulic or cable operation of bulldozers and scrapers, was apparent at the show. Two completely hydraulic excavating machines, the Gradall and the Bucyrus-Erie Hydrocrane, were displayed. Each has a boom which telescopes, rises and falls hydraulically. The Gradall has a hand-like scoop bucket attached to the end of the boom. The hydrocrane hoists a clamshell or hook hydraulically. The hydraulic line to the bucket-closing cylinder also acts as a tag-line.

A few of the hydraulic ram users have provided dust protection to the pistons by enclosing them in accordion-folds of flexible material. Euclid has done it on the big elevating grader and Wooldridge has done it on the steering ram of an experimental Terracobra.

Management of the Show

The show was sponsored by the American Road Builders' Association, of which J. T. Callaway is president; W. B. Greene is president of the Construction Industries Association (manufacturers' division of ARBA), and Charles M. Upham is engineer-director. The Associated Equipment Distributors, of which A. F. Garlinghouse is president, cooperated with ARBA.

Comments by members of the manufacturers' division indicated general satisfaction with the interest evidenced by contractors and distributors in the display of road building equipment at Soldier Field. Mr. Greene who is also president of the Barber-Greene Co., pointed out that the many delegates representing 60 foreign countries "augurs well for the continued expansion of the U. S. equipment manufacturers' export business."

Soil-cement stabilization demonstrated during show

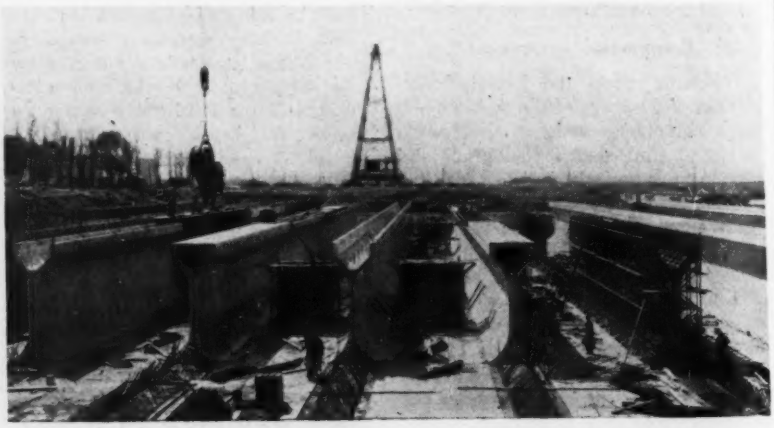
Realism was carried to a logical conclusion at the Road Show in an off-grounds soil-cement stabilization project. A free bus transported visitors to Northerly Island airport, built on refuse-made land about a mile east of Soldier Field, where several manufacturers collaborated to surface 18,000 sq. yd. of light-plane parking area during the show.

Operations centered around the one-lane P & H Single Pass stabilizer, a crawler-mounted machine that pulverizes and blends existing material to controlled depth, adds liquids in specified proportions and spreads the mix. On the Northerly Island job a tractor-hauled T.L. Smith uniform-rate belt spreader laid cement ahead of the stabilizer, which pushed a Gunnison truck tank, the source of water for the operation. Compaction equipment followed, a Heil sheepsfoot roller for the initial step, then a spike-tooth harrow for removing compaction planes, and a pneumatic-tired wobblewheel roller. The Austin-Western 99 power grader final-shaped the pass and a Galion tandem rolled the resulting surface.

Originally the Cedarapids 30-ton vibrating compactor was planned for use in initial compaction, but the machine was needed for consolidation of refuse fill prior to stabilization. Power for the towed machines was by Oliver-Cletrac crawler, Caterpillar wheel-type and J. I. Case industrial rubber-tired tractors. The Portland Cement Association also cooperated in the project.

Characteristically, the refuse fill presented some construction problems that would not be encountered in natural earth. Pieces of broken concrete and stone were removed from the surface by hand. Those that remained were a minor problem in stabilizer operation. Bedsprings and miscellaneous wire had to be removed from stabilizer rotors from time to time.

Daily output was lower than that of a full-scale job because the parade equipment-at-work was conducted only during scheduled showings. At that, it was necessary to stop work on July 22 to save one final strip for completion during exercises July 23, when the project was donated to the city.



AERATION TANK CHANNELS—Four tanks, each with four 410-ft. long channels, will supply air at the rate of 0.4 cu. ft. per gallon of sewage at Philadelphia's new $9,000,000 Northeast sewage treatment works. A 75 percent b.o.d. removal is expected on a 125 mgd flow.

Equipment eclipses technical sessions

Interest in the equipment on display at the Road Show was so sustained that the technical sessions of ARBA divisions over at the Stevens Hotel suffered for lack of participants as did the general sessions at the Road Show Pavilion, only a handful coming to several of the meetings.

Notable exceptions were the four morning meetings arranged for the visitors from foreign countries—seventy countries being represented—at which representatives of the Public Roads Administration spoke on highway practices in this country, and the parallel sessions sponsored by the ARBA Educational Division to acquaint college professors and instructors with current practice in the use of construction equipment. These sessions were arranged by H. W. Richardson, executive editor of *Construction Methods* with the cooperation of members of the Manufacturers Division. They were chiefly illustrated talks, each day being devoted to a few types of equipment.

Many foreign visitors

Several hundred delegates from 60 countries gave the ARBA meetings and the Road Show an international flavor. Special sessions for them were held on July 17, with talks by W. W. Polk, chairman of the International Committee, J. T. Callaway, president of the ARBA, Chas. M. Upham, engineer director, Francis H. Russell of the Department of State, E. W. James, of the Public Roads Administration, Alberto Lleras, secretary general of the Organization of American States (formerly the Pan-American Union), and Senator Dennis Chavez of New Mexico.

Several of these speakers spoke in favor of early completion of the Inter-American Highway. Specific details of progress to date were given by Mr. James, who said that 51 percent of the entire route from Laredo, Texas, to Panama has been paved with some kind of artificial binder; of the remainder, 28 percent is open to all-weather travel, 12 percent to dry-weather travel, and only 9 percent (about 300 miles) is impassable.

Less highway per dollar

Although the dollar volume of highway construction has increased steadily since the war, the volume of physical improvements put under contract has declined, Major General Philip B. Fleming, head of the Federal Works Agency, told the 1,000 members and guests assembled for the ARBA banquet. The highway dollar will pay for only half as much road work as it did in 1940, hence, although the states, in the first five months of this year, have contracted for $425,000,000 of federal-aid work (exclusive of two large bridges), this is only going to build 17,679 miles, whereas, in 1940, $522,000,000 built 32,594 miles of roads.

Because of the higher costs of today, the physical volume has not reached pre-war levels although the need is much greater, General Fleming said.

General Fleming added that there are indications that the peak of costs is beginning to level off, also that the going for road builders will not be quite so rough in 1949.

Representative Paul Cunningham, speaking to the highway contractors, said that the reason why the current highway authorization was whittled down to $450 million was for lack of a good selling job on the part of those who know the country's growing highway needs. He plans to introduce legislation to raise the annual appropriation to at least $500 million, but laid special stress on the fact that if Congress is to be convinced of the need for more money, the available money must all be put under contract. "Get in a bid for road work if you want a continuing program," he urged.

More road funds needed

Addressing a meeting of the American Institute of Local Highway Officials, Charles M. Upham, engineer-director of ARBA, stated that this country is on the eve of a great highway expansion program necessitated by a tremendous increase in highway use, citing as an example the increase in truck haulage from 28 billion ton-miles in 1939 to 85 billion in 1947. Mr. Upham re-emphasized the ARBA's belief that a balanced program of primary, secondary, urban and inter-regional roads is essential. Annual highway construction should be in the neighborhood of 2 billion dollars, Mr. Upham declared, and mileage under the federal-aid system should increase 25 percent over its present 600,000 miles.

Members learned that the institute plans to issue a monthly report to keep them informed on local highway matters. To be called "Local Roads", the publication will also detail major developments at the state and national level so members can act cooperatively on a country-wide scale.

An institute committee report indicated that design standards now being used for secondary federal-aid construction provide sufficient latitude for all types of local highways. That public relations programs have been badly neglected at the local level was brought out in another report.

Current highway practices

The four three-hour lectures on current highway practices were prepared under the general direction of H. S. Fairbank, deputy commissioner of the PRA in charge of research and individual sections into which the series of talks were divided were presented by E. W. James, R. E. Royall, William L. Haas, Clarence A. Steele, Mr. Fairbank, E. H. Holmes, O. K. Normann, Joseph Barnett, H. E. Hilts, Carl F. Izzard, Harold Allen, C. N. Conner, E. F. Kelley, J. S. Bright, A. C. Clark and H. A. Radzikowski.

At the first of the four sessions,

(*Continued on page* 16)

LABORATORY-RADIO STATION—New electrical engineering building at the University of Washington, at Seattle, will house research labs, shops and a radio transmitter as well as classrooms.

Thomas H. MacDonald, head of the PRA, said that they had been designed to facilitate an understanding of the proper place of the construction equipment on display at the Road Show in any highway program, that the mechanical equipment this country has developed is the greatest contribution that we can make to the economic development of other countries, but that it can be of little use to those countries if they have not first enacted legislation for the administration of a sound highway program. Consequently, Mr. MacDonald said, the first session of the course was being given over to a review of this country's experience in developing and financing its highway system.

The three following sessions were devoted to planning highway systems and development of standards; design of foundations, drainage and pavement; and construction and maintenance. The four lectures had been preprinted as Technical Bulletins No. 141-144 inclusive, American Road Builders Association, and can be obtained from the association headquarters in Washington.

Construction equipment review

The first of the four sessions on current practice in the use of construction equipment arranged by the Educational Division was devoted to earthmoving with shovels, cranes, draglines, wagons and loaders. J. L. Beltz of the Thew Shovel Co. presented a film, "This Changing World", prepared by the Power Crane & Shovel Assn., which described this equipment, its operation and its application. Off-highway hauling units—trucks and wagons—with axle loadings up to 60,000 lb., were explained by V. L. Snow of Euclid Road Machinery Co., whose film also showed application of elevating loaders for earthmoving.

In a second session on earthmoving, O. Q. Hinds and Robert Evans of Caterpillar Tractor Co. detailed in lectures and films the role of motor graders and crawler-type bulldozers in roadbuilding. Similarly presented were rubber-tired bulldozers and carrying scrapers. For these, Dan Heiple of R. G. LeTourneau, Inc., supplemented his talk with films from his firm and from LaPlant-Choate Mfg. Co.

An illustrated lecture on the function and types of bituminous paving equipment by E. H. Holt of Barber-Greene Co. followed explanatory talks by George Dent, Asphalt Institute, and Paul Critz, PRA. Mr. Holt pointed out the increasingly large proportion of bituminous roads in this country, and outlined the various types—from surface treatment to plant mixes. Mr. Critz described present construction methods and emphasized that much of the advantages of modern road technology can be lost through use of the wrong equipment. Adequate equipment is now available for almost every requirement, he pointed out, but it must be properly operated and well maintained.

In the final session, devoted to aggregate preparation and concrete construction, Henry Adams of Iowa Manufacturing Co. and J. F. Robbins of Koehring Co. explained modern equipment for these purposes.

Educational division

A full-time director for the Educational Division is to be employed soon, Charles M. Upham told the opening session of that division, because of the expansion of its activities and the possibilities for doing a much better job by that means. The division now has 10 student chapters at engineering schools and is planning for many more, according to H. S. Carter, professor of civil engineering department of the University of Utah. Prof. Carter stressed the importance of these chapters as a means for giving students a better understanding of highway work and for stimulating their interest in that field as a career, especially if both highway engineers and road contractors are brought in as speakers.

In setting up these chapters, Prof. Carter recommended that they be integrated closely with the local student chapters of ASCE and that they limit their activities to highway work, leaving planning for other meetings and social activities to the ASCE chapter.

H. T. Heald, president of Illinois Institute of Technology, in a discussion of training men for highway work, stressed the growing importance of skill in managing men and machines, also the need for better trained engineers in the highway field to cope with the more complex engineering and research work required of highway engineers.

On the stimulation of interest in highway work, A. Diefendorf, head of the civil engineering department at the University of Utah and president of the division, cited the many advantages to be gained by maintaining close contact with local highway departments and by sponsoring highway conferences for local men.

Highway curricula

Preliminary results of highway subjects being taught in 137 engineering schools in this country and Canada were given by J. B. Butler, professor of civil engineering, Missouri School of Mines. Of the 88 schools that have replied to date, 27 offer highway engineering as a major subject for M. S. degree; the amount of instruction in the others ranges over a wide area.

Further abstracts of technical meetings will appear in news pages of a subsequent issue.

PRA holds $570 million for state road aid

Final figures released last week by the Public Roads Administration indicated that $570,135,000 of federal-aid funds are available for obligation by the states during fiscal year 1949.

The report, made up as of June 30, 1948, said that the total includes $194,042,000 in unprogrammed balances credited to the states, and $376,093,000 in programmed projects accepted by PRA headquarters and returned to district offices for final approval of plans.

With the matching funds furnished by the states, the total cost of the programmed projects comes to $726,355,000.

As of June 30, the states had under construction a total of $894,975,000 of work on federal-aid highway projects. Federal money included in that total amounts to $459,694,000.

Mileage of all projects in process runs to the sizable total of 41,700 miles.

Federal-aid funds available to the states on June 30 were those remaining from the total of $1,500,000,000 authorized for the first three postwar years by the highway act of 1944.

Penna. installs radio on highway equipment

Following successful tests last winter, the Pennsylvania Department of Highways will install radio facilities on its equipment in 18 counties for use in snow removal work.

The installations will be made in counties where snow removal is the heaviest.

Kentucky frees 19th highway toll bridge

The Rockport bridge over Green River, on U. S. Highway 62—the last of Kentucky's intrastate toll bridges—was opened to free traffic following ceremonies last week.

The bridge, built at a cost of $573,000, was opened to traffic in 1940 and is one of twenty bridges built or acquired by the state under an act of 1928 which permitted the state to buy the bridges, pay them off through tolls and then make them free structures.

Freeing of the bridge leaves only one remaining toll bridge in the state.

OBITUARY

Henry W. Petersen, Sr., 68, civil engineer formerly employed by the Kopper Co., died recently at St. Petersburg, Fla.

John Willis Trumbo, 78, former supervisor for the Kentucky state department of highways, died July 18 at Louisville. He retired from the highway position about ten years ago due to ill health.

Earl Charles Thomas, 57, professor of civil engineering at Stanford University, died July 8 in Palo Alto, Calif. Graduated from Stanford University in 1914, he was a member of the engineering faculty for 24 years. He was a former mayor of Palo Alto, and at the time of his death was a member of the local engineering firm of Thomas & Whipple.

Vance W. Marquis, former employee of the state highway department, died July 10 at Ames, Iowa. For the past few years he had been a civil engineer with the U. S. Public Roads Administration. He was a graduate of the University of Nebraska.

Joseph D. King, 67, former city engineer, died recently at Altoona, Pa. Prior to becoming city engineer, he was engaged in the engineering and contracting business in Altoona. Retired in 1946, he was a member of the Pennsylvania Society of Professional Engineers.

Brig. Gen. John Jennings Kingman, 66, retired assistant chief of Army engineers died July 21 at Washington, D. C. Former district engineer at Providence, R. I., and Boston, Mass., and engineer of the South Pacific Division, he took up duties at Washington, D. C., in 1938. There, as acting chief of Army engineers, he played an important role in the administration's recovery program.

Per O. Haak, 37, construction engineer associated with Charles T. Main, Inc., Boston, died July 12, in Arlington, Mass. He attended the Massachusetts Institute of Technology and was a member of the Boston Society of Civil Engineers and the American Society of Civil Engineers.

Col. Thomas A. Adcock, 56, assistant professor of military science at College Station, Texas, was killed at Fort Belvoir, Va., July 24. Attached to an engineer ROTC unit, Col. Adcock was injured during demolition demonstrations.

N. Y. and Ontario push joint power project

New York's bid to develop power at the international rapids of the St. Lawrence River, in conjunction with the Canadian Province of Ontario, passed its first hurdle this week. The Army's Chief of Engineers gave the project preliminary approval in a communication to the Federal Power Commission.

Though merely tentative, the Army's approval of the New York-Ontario plans clears the way for FPC action on the application for license to construct and operate power facilities on the U. S. side of the international boundary. The application was filed by the New York Power Authority July 16.

FPC already had set August 26 as the final date for formal protests against the project. The commission probably will schedule hearings for mid-September, providing the New York agency is prepared to present its case by that time.

Barring unforeseen complications, FPC may be expected to consider the application favorably. The commission long has been on record as supporting development of power on the St. Lawrence.

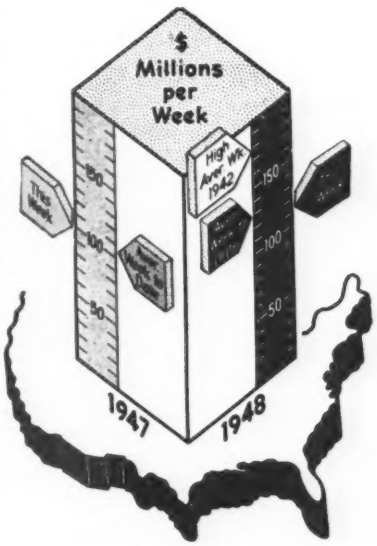
When—and if—FPC and the Army clear the license, the project will go to the International Joint Commission, technically for final approval. Actually, however, IJC is empowered to do little in connection with such a proposal further than iron out any differences arising between Canada and the U. S., but no differences are expected to be encountered. If New York and Ontario build the power dam and plant, much of the cost of navigation improvements contemplated in the Army's seaway plans will be eliminated. Thus, it may be much easier to obtain Congressional approval for U.S.-Canadian development of the navigation features.

Actually, the Authority is expected to share the eventual power output with other states—probably Vermont and New Hampshire. The Authority and the Ontario commission each will install 18 generating units, sharing equally the total output estimated at 2,200,000 hp.

Privately-owned electric utilities of the area are not likely to oppose the development. They need the power and probably will get much of it. The New York authority is not contemplating construction of transmission lines, expecting to use utility lines to carry the new energy to its customers.

Completion of all the power facilities —a dam from the U. S. shore to the upstream end of Barnhart Island, a powerhouse and dam from the island to the Canadian shore, dikes and other facilities—will take about seven years.

CONSTRUCTION ACTIVITY



As Reported this week to . . .
Engineering News-Record

CONTRACT VOLUME

Continental U. S. Only
(Thousands of Dollars)

	Week of July 29 1948	Cumulative 1948 (31 wks.)	Cumulative 1947 (31 wks.)
Federal	$13,673	$602,049	$408,675
State & Mun.	48,377	1,463,174	993,672
Total Public.	$62,050	$2,065,223	$1,402,347
Total Private	52,226	1,981,865	1,795,756
U. S. Total	**$114,276**	**$4,047,088**	**$3,198,103**

WHERE CONSTRUCTION ACTIVITY ORIGINATED THIS WEEK

Dollar Volume (Thousands)

Type of Work	This Week	Cumulative 1948 (31 wks.)	Cumulative 1947 (31 wks.)
Waterworks ...	$2,043	$110,745	$65,665
Sewerage	4,313	127,572	76,413
Bridges	4,801	172,667	101,546
Highways	18,441	595,256	474,428
Earthwork, Waterways	2,889	300,346	190,709
Buildings, Public	25,551	633,243	325,704
Industrial ...	11,175	580,631	480,735
Commercial ..	39,609	1,153,823	1,049,975
Unclassified ...	5,454	374,805	432,928

NOTE: Minimum size projects included are: Waterworks and waterway projects, $28,000; other public works, $50,000; industrial buildings, $68,000; other buildings, $250,000.

NEW PRODUCTIVE CAPITAL

	Cumulative 1948 (31 wks.)	Cumulative 1947 (31 wks.)
NON-FEDERAL	$3,124,859	$1,452,917
Corporate Securities	1,605,279	497,890
State and Municipal	1,092,291	707,316
Fed. Aid Highway.	427,289	247,711
FEDERAL	1,558,932	818,729
Total Capital	**$4,683,791**	**$2,271,646**

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost	Aug. '48	475.51	228.58
Building Cost	Aug. '48	355.45	192.15
Volume	July '48	213	93

CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager *J. A. MAHONEY, Reports* *E. R. BIGGERSTAFF, M. R. ROESSLER, Statistics*

WATER SUPPLY

BIDS ASKED

Bids Asked August 2

N. C., Charlotte — City, Henry A. Yancey, city mgr., addn. to Catawba River Pumping Station, Plans deposit $20. J. N. Pease & Co., 119½ E. Fifth St., Engrs.

Utah, Laytona — Town, c/o R. C. Robins, clerk, 13,850 ft. concrete, steel supply line and pressure mains from 2 to 12 in. diam. Sumner G. Margetts & Co., Felt Bldg., Salt Lake City, engrs.

Bids Asked August 3

Wis., Altoona — City, WW system.

Bids Asked August 11

N. C., Chapel Hill — University of North Carolina, at office of W. D. Carmichael, Jr. Controller, Chapel Hill, 3. m.g. capacity water filtration plant. Plans deposit $25. Wm. C. Olsen, 5 Exchange Pl., Raleigh, engr.

Bids Asked August 17

N. Y., Woodstock—Town, Town Hall, Sect. 1, wells, pumping equip. pumping station bldg., controls; Sect. 11, watermains, valves, hydrants, appurtenances; Sect. 111, standpipe. Plans deposit $25. Keis & Holroyd, 257 Broadway, Troy, consult. engrs. CD 5/25/45—ENR 6/14/45.

Bids Asked August 24

N. C., Durham — City, R. W. Flack, city mgr., exten. to filter plant, control bldg., mixing chamber, laboratory, 2.3 M. gals. clear water storage, raw water intake line, 3 clear water pumping units, Plans deposit $25. Piatt & Davis, Durham, engrs. CD 2/18/47—ENR 3/6/47.

Bids Asked August 26

Ind., Kendallville—Bd. P. Wks., R. C. Moses, mayor, City Hall, imprv. W.W., Div. A, exten. feeder mains, Div. B, water softening and iron removal plant, Div. C, 500,000 gal. 100 ft. high elevated steel tank. $365,000. Plans deposit $25. Boyd C. Phelps & Assoc., 232 Franklin St., Michigan City, engr. CD 10/12/45—ENR 11/1/45.

LOW BIDDERS

Calif., Berkeley — Bd. Regents, Univ. of Calif., Berkeley, July 13, installing high pressure water sys. from Bowles Hall to Life Sciences Bldg., Univ. of Calif. Campus, from Underground Constr. Co., 75 Ave. and San Leandro Blvd., Oakland, **$43,430.**

Calif., Oakland — East Bay Municipal Utility Dist., 512 16 St., install. approx. 20,400 lin. ft. 2 to 12 in. c.i and asbestos cement water mains in Contra Costa Co., 20,100 lin. ft. 4 to 8 in. cast i. and asbestos-cement water mains in Alameda Co., Spec. LS-430. from Associated Electrical & Mechanical Co., 223 Clara St., San Francisco, Sched. 1, **$50,825;** CD 7/8—ENR 7/15.

Colo., Denver—Denver City and Co. Bd. Water Comrs., postponed bids to have been opened July 2, water main exten., 42 in. conduit from West 32 Ave. and Sheridan Blvd. north to W. 33 Ave., east to Zenobia St., north to W. 45 Ave.; 36 in. conduit east to Lowell Blvd., 24 in. conduit to Grove St.; $488,000; 42 in. conduit from the Ashland Ave. reservoir at W. 29 Ave. and Fenton St. east to Sheridan Blvd., connection with other mains and pump stations; $220,000; 42 in. conduit from Kearny St. and Mountview Blvd. to vicinity of Monaco, 24 in. to Xanthia St., connection with 24 in. north and south main. $350,000. Total $958,000. John Burgess, engr. Extended date. CD 6/17—ENR 6/24.

Colo., Manitou Springs — City, Manitou Springs, water sys. imprvs., raising reservoir 5 ft., rejected bids July 9, Est. **$40,000.** Will readvertise. CD 7/6—ENR 7/8.

●**Md., Baltimore**—Mayor & City Council, City Hall, July 21, 52,000 ft. long, lined sections 10 ft. diam. unlined sections 11 ft. diam Patapsco Liberty Road Tunnel, incl. concrete portions of dam, etc. from Samuel R. Rosoff, Ltd., 3001 Druid Park Dr., **$9,717,777.** CD 7/7—ENR 7/15.

Pa., Birdsboro—Dpt. Property & Supplies, 18 and Herr St., Harrisburg, rejected bids June 16, alterations and addns., water supply, plumbing and sewage disposal sys. at bathhouse of Six-Perry Day Use Area, French Creek Park, near here. L.B. **$42,600.** Will readvertise. CD 6/21—ENR 6/24.

Pa., Wernersville—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, July 14, imprv. hot water generation and distr. lines at Wernersville State Hospital, from Philadelphia Mechanical Contractors, Inc., 1223-25 Carlton St., Phila., Zone 7, **$50,905.** Est. $100,000. CD 6/30—END 7/8.

Tex., Bryan—City, I. N. Kelly, mayor, earthen dam at Camp Creek Lake, from F. C. Herrling, Kurten, **$110,552.** Est. $100,000. CD 7/1—ENR 7/8.

Ont., Kingston—City, Kingston Public Utilities Comn., A. E. Sansbury, chn., 19 Queen St., repairing waterworks dock, King St. Pumping Station, incl. 11,800 sq. ft. steel sheet piling, from Russell Constr. Co., Ltd., Harbor Commissioners Bldg., Toronto, Approx. **$52,567.**

CONTRACTS AWARDED

Ill., Centralia—City, clk., City Hall, filter plant for water works sys., to Guy E. Tillman, 113 S. Hickory St., **$270,000.** Bids 7/14. CD 6/7—ENR 6/10.

Ia., Eagle Grove—Bd. Waterworks Trustees, Eagel Grove, 400,000 gal. steel water tank, to Pittsburgh-Des Moines Steel Co., 1015 Tuttle St., Des Moines, **$61,900.** Bids 7/14. CD 6/24—ENR 7/1.

N. D., Grand Forks — City, water mains, Sect. 1, to Northern Constr. Co., 509 S. 3 St., **$62,730.** Bids closed 7/6.

O., Columbus—Amvets Homestead Assoc., c/o Dudley Underwood, 6 Frambes Ave., water sys., sewerage, drainage on Sunbury Rd. for Veterans Village to Thompson Conie Co., 1340 Windsor Ave., **$144,650.**

O., Columbus—Franklin Co. Bd. Comr. installing waterline in Truro Sect. 1, Imprv. No. 201 to Thompson-Conie Co., 1340 Windsor Ave. **$77,521.** Allan Slade, county engr.

Pa., North Huntington Twp.—Municipal Auth. of North Huntington Twp., Box 107, Irwin, WW, 19 mi. 8 and 6 in. cast iron pipe, 5,000,000 gal. reservoir, to Mike Manella Co., 12 McCandless St., Pittsburgh, **$385,500.** Jos. E. Burke & Assoc., Magee Bldg., Pittsburgh, engrs.

R. I., North Kingston—Town, Water Comrs., Town Hall, water sys. extens. to Joseph Tirocchi & Son, 268 Hartford Ave., Providence. **$99,480.** Bids 7/6. CD 6/28—ENR 7/1.

Tex., Houston—C. E. King, 2012 Rice Blvd., waterlines, facilities. Own forces. **$33,000.**

Wash. Spokane — City, City Hall, constructing on existing basin of 10 m.g. covered reservoir, concrete lined, to Central Constr. Co., W 918 Mallon St., **$380,877.** Est. $350,000. Bids 7/15. CD 6/30—ENR 7/8.

Alta., Lethbridge — Municipality, watermains. Day labor, **$55,615.** CD 3/14/46—ENR 4/4/46.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterworks $25,000; other public works $50,000; industrial buildings $65,000; other buildings $250,000.

Classes of Construction

(Name in order of Listing)

Water Supply	**Latin America**
Sewers, Waste Disposal	**Public Buildings**
Bridges	**Commercial Buildings**
Streets & Roads	**Industrial Buildings**
Earthwork, Waterways	

Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.;

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

♦ Federal Government
● Project of $1,000,000 or over.
ENR Engineering News-Record
CD Engineering News-Record Construction Daily

Ont., Pembroke—Town, S. A. Thompson, clk., installing pumping station and sewers, west end, to M. Barr Constr. Ltd., 561 Division St., Kingston, Approx. **$47,365.** CD 2/20—ENR 3/4.

SEWERS, WASTE DISPOSAL

BIDS ASKED

Bids Asked August 2

Md., Towson — County Comrs. Baltimore Co., Court House, 6,200 lin. ft. 8- to 15-in. vitr. clay pipe sewers, manholes, wyes, connections, etc. 9 electorial dist., Plans deposit $5. Wm. F. Neale, Towson, ch. engr.

Bids Asked August 4

Calif., San Francisco—Dpt. P. Wks., City Hall, Lake St. sewer sys. Sec. A in 17 Ave. and Lake St., and in Presidio Military Reservation, Spec. 20,194. Over $50,000. Plans deposit $10. R. Wadsworth, city engr.

Bids Asked August 5

Tex., El Paso—City, W. R. Collins, clk., 6,750 lin. ft. concrete lined outfall canal. Ashley G. Classen & Assoc., 504 N. Kansas St. consult. engrs. adv. ENR 7/29. CD 1/22—ENR 2/5.

Bids Asked August 9

Calif., Hanford—City, City Hall, sewage disposal plant addn. and pump station. $250,000. Plans deposit $25. Quinton Engineers Ltd., 816 S. Figueroa St., Los Angeles, engrs. CD 11/21/47—ENR 11/27/47.

Bids Asked August 10

La., Mansfield — Town, extens. sanitary sewer sys., outfall line and sewage disposal plant, Plans deposit $5 each. Pan-American Engr., 1418 3 St., Alexandria, engrs. CD 6/30—ENR 7/24.

Bids Asked August 11

Calif., Hanford—City, City Hall, sewage treatment plant and booster pumping plant. Over $200,000. Plans deposit $25. Quinton Engineers, 816 S. Figueroa St., Los Angeles, engrs.

Bids Asked August 16

Calif., Salinas — Pajaro Sanitation Dist., Courthouse, Salinas, Unit 1, main trunk lines, outfall sewers and collection sys., Unit 2, sewage pumping and screening plant, Approx. $100,000. Plans deposit Unit 1 $10, Unit 2 $25. CD 10/8/47—ENR 10/16/47.

Bids Asked August 18

Calif., San Francisco—Dpt. Pub. Wks., City Hall, Lake Merced Sewer, Section D., Over $50,000. Plans deposit $10. R. Wadsworth, city engr. CD 6/26—ENR 7/8.

Bids Asked

●**Mass., New Bedford** — City, P. J. Foley, comr. P. Wks., Municipal Bldg., 3 mi. interceptor sewers, **$1,000,000.** Fay, Spofford & Thorndike, 11 Beacon St., Boston, engrs. CD 1/8—ENR 1/22.

LOW BIDDERS

Calif., Armona—Armona Sanitary Dist., 609 Pima St., July 16, santary sewage sys. and treatment works, from Ted. Bares Constr. Co., 365 Warwick Ave., San Leandro, Sched. A. **$80,842,** Sched. B., **$79,426.** CD 7/6—ENR 7/8.

Calif., Delano—City, 1118 Jefferson St., July 15, outfall sewer, pumping plant, from Pipeline Constructors, Box 97, Bakersfield, **$50,447.** CD 6/26—ENR 7/1.

Calif., Irvington—Irvington Sanitary Dist., 103 Mission St., July 13, addnl. sewers, from A. J. Peters & Son, 534 Stockton Ave., San Jose, **$117,133.** CD 6/26—ENR 7/1.

Del., Newark—Newark City Council, Newark, cancelled bids to have been opened July 27, sewage disposal plant, pumping station. Approx. $50,000. Whitman, Requardt & Associates, 1304 S. Paul St., Baltimore, Md., engrs. Will readvertise. CD 7/15—ENR 7/22.

N. Y., Elmira—City, sewer on Fifth St., from John Costello, Elmira, **$124,509.** CD 7/17/46—ENR 7/8/46.

N. Y., New York—Bd. Water Supply, 120 Wall St., Zone 5, July 16, Contr. 396, Grahamsville sewerage sys., town of Neversink, Sullivan Co. from DiMarco & Ciccone, Inc., 151 E. Post Rd., White Plains, **$743,215.** Alt. $745,815. CD 6/30—ENR 7/8.

Ore., Baker—City, City Hall, sewer sys. in Grandview and East side areas from Bitter Mountain Plumbing Co., Boise, Ida. A. **$181,003.** B $187,216. C. E. Stockman, Rand Bldg., engr. CD 1/8—ENR 1/22.

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